

WHAT IS CLAIMED IS:

1 1. A method for making a colorful three dimensional model comprising steps of:
2 inputting three dimensional original measured data;
3 reconstructing mesh models with regular data;
4 abstracting color information;
5 harmonizing color of texture images; ; and
6 pixel blending to overlapped texture images between the mesh models.

7 2. The method as claimed in claim 1, wherein the mesh model reconstructing
8 step comprises:

9 selecting a generic model according to the original measured data;
10 adjusting dimension and spatial position of the generic model to overlap with
11 the original measured data; and
12 mapping data of the generic model with the original measured data to deform
13 the generic model data to be close to the original measured data.

14 3. The method as claimed in claim 1, wherein the color abstracting step is to
15 establish texture-mapping relationship between two dimensional image of the original
16 measure data and the generic model, which comprises:

17 seeking mapping points of mesh points of the generic model on the original
18 measured data and triangles having the mapping points;
19 calculating corresponding texture coordinates of the mapping points; and
20 checking continuity of the triangles on the texture images.

21 4. The method as claimed in claim 1, wherein the color harmonizing step
22 comprises:

23 rearranging sequence of measured data according to the overlapped relationship

1 and the magnitude of the overlapping area to be $M' = \{M'_1, M'_2, \dots, M'_n\}$, wherein M'_n
2 represents data consisting of n three dimensional mesh models M' ;

3 calculating color adjustment A_i ($i=1,2,3,\dots,n$) of the texture image of each original
4 measured data; and

5 adjusting color average of the overlapped area.

6 5. The method as claimed in claim 2, wherein the color harmonizing step
7 comprises:

8 rearranging sequence of measured data according to the overlapped relationship

9 and the magnitude of the overlapping area to be $M' = \{M'_1, M'_2, \dots, M'_n\}$, wherein M'_n
10 represents data consisting of n three dimensional mesh models M' ;

11 calculating color adjustment A_i ($i=1,2,3,\dots,n$) of the texture image of each original
12 measured data; and

13 adjusting color average of the overlapped area.

14 6. The method as claimed in claim 3, wherein the color harmonizing step
15 comprises:

16 rearranging sequence of measured data according to the overlapped relationship

17 and the magnitude of the overlapping area to be $M' = \{M'_1, M'_2, \dots, M'_n\}$, wherein M'_n
18 represents data consisting of n three dimensional mesh models M' ;

19 calculating color adjustment A_i ($i=1,2,3,\dots,n$) of the texture image of each original
20 measured data; and

21 adjusting color average of the overlapped area.

22 7. The method as claimed in claim 4, wherein the color harmonizing step
23 comprises:

24 rearranging sequence of measured data according to the overlapped relationship

1 and the magnitude of the overlapping area to be $M' = \{M'_{1}, M'_{2}, \dots, M'_{n}\}$, wherein M'_{n}
2 represents data consisting of n three dimensional mesh models M' ;

3 calculating color adjustment A_i ($i=1,2,3\dots n$) of the texture image of each original
4 measured data; and

5 adjusting color average of the overlapped area.

6 8. The method as claimed in claim 4, wherein $A_i = (A_{i,1} \times W_{i,1} + \dots + A_{i,n} A_{i-1} \times$
7 $W_{i,n} W_{i-1}) / (W_{i,1} + \dots + W_{i,i-1})$

8 where W_i is mesh influenced weight value.

9 9. The method as claimed in claim 5, wherein $A_i = (A_{i,1} \times W_{i,1} + \dots + A_{i,n} A_{i-1} \times$
10 $W_{i,n} W_{i-1}) / (W_{i,1} + \dots + W_{i,i-1})$

11 where W_i is mesh influenced weight value.

12 10. The method as claimed in claim 6, wherein $A_i = (A_{i,1} \times W_{i,1} + \dots + A_{i,n} A_{i-1} \times$
13 $W_{i,n} W_{i-1}) / (W_{i,1} + \dots + W_{i,i-1})$

14 where W_i is mesh influenced weight value.

15 11. The method as claimed in claim 7, wherein $A_i = (A_{i,1} \times W_{i,1} + \dots + A_{i,n} A_{i-1} \times$
16 $W_{i,n} W_{i-1}) / (W_{i,1} + \dots + W_{i,i-1})$

17 where W_i is mesh influenced weight value.

18 12. The method as claimed in claim 1, wherein the pixel blending step to the
19 overlapped texture image comprises:

20 seeking the overlapped images covered by each triangle within overlapped
21 areas;

22 calculating distances of vertices of each of the triangles within the overlapped
23 areas to nearest edges of corresponding mesh; and

24 calculating pixel weight average to mapping area corresponding to each

1 triangle.

2 13. The method as claimed in claim 2, wherein the pixel blending step to the
3 overlapped texture image comprises:

4 seeking the overlapped images covered by each triangle within overlapped
5 areas;

6 calculating distances of vertices of each of the triangles within the overlapped
7 areas to nearest edges of corresponding mesh; and

8 calculating pixel weight average to mapping area corresponding to each
9 triangle.

10 14. The method as claimed in claim 3, wherein the pixel blending step to the
11 overlapped texture image comprises:

12 seeking the overlapped images covered by each triangle within overlapped
13 areas;

14 calculating distances of distal points of each of the triangles within the
15 overlapped areas to nearest edges of corresponding mesh; and

16 calculating pixel weight average to mapping area corresponding to each
17 triangle.

18 15. The method as claimed in claim 4, wherein the pixel blending step to the
19 overlapped texture image comprises:

20 seeking the overlapped images covered by each triangle within overlapped
21 areas;

22 calculating distances of vertices of each of the triangles within the overlapped
23 areas to nearest edges of corresponding mesh; and

24 calculating pixel weight average to mapping area corresponding to each

1 triangle.

2 16. The method as claimed in claim 8, wherein the pixel blending step to the
3 overlapped texture image comprises:

4 seeking the overlapped images covered by each triangle within overlapped
5 areas;

6 calculating distances of vertices of each of the triangles within the overlapped
7 areas to nearest edges of corresponding mesh; and

8 calculating pixel weight average to mapping area corresponding to each
9 triangle.

10 17. The method as claimed in claim 11, wherein the pixel blending step to the
11 overlapped texture image comprises:

12 seeking the overlapped images covered by each triangle within overlapped
13 areas;

14 calculating distances of vertices of each of the triangles within the overlapped
15 areas to nearest edges of corresponding mesh; and

16 calculating pixel weight average to mapping area corresponding to each
17 triangle.